PROJECT STATEMENT

STATE: **DELAWARE** GRANT: **W35R-10**

GRANT TITLE: **WILDIFE INVESTIGATIONS – WHITE-TAILED DEER**

JOB SCHEDULE: **OCTOBER 1, 2009 – SEPTEMBER 30, 2010**

State: Delaware

Grant Number and Title:

W 35 R – Wildlife Investigations: White-tailed Deer

Objective:

To maintain a healthy and viable deer herd and minimize human/deer conflicts.

Job Number and Title:

Job 1. White-tailed Deer Mortality Evaluation

Job Objectives:

To determine the number of deer harvested, harvest distribution, general health and condition of the herd and age and sex ratios.

To evaluate road kill and other non-hunting mortality.

Activity:

The 2008/09 deer season provided hunters with 132 days of hunting opportunity beginning September 1, 2008 and ending January 31, 2009. Archery hunters were allowed to hunt during this entire period, excluding Sundays. Muzzleloader hunters had an 8-day October season and a 6-day January season, but were also allowed to use that weapon during the designated shotgun seasons. Shotgun hunters had an 8-day November season and a 7-day January season as well as a 7-day October antlerless and 7-day December antlerless deer season. Furthermore, handgun hunters had a 7-day season in January and youth hunters had a 1-day special hunt in November. All seasons were open statewide.

License and tagging requirements were again gender specific in Delaware during the 2008/09 season. Only antlerless deer could be taken on the general hunting license tags and 2 of those had to be females (does). A Hunter's Choice combination tag and a Quality Buck tag could be purchased (1 set/hunter) by Delaware residents. A Hunter's Choice tag allows a hunter to take 1 deer of their choice (antlered or antlerless) and the Quality Buck tag could be used to tag a buck with a minimum outside antler spread of at least 15 inches. Non-residents could purchase an antlered deer tag as well as a separate Quality Buck tag. The purpose of the Quality Buck tag is to allow hunters to take a second antlered buck without putting additional pressure on yearling males. Additional antlerless deer tags were also available for hunters to purchase for $10 each. In areas with significant crop damage, hunters could use special antlerless deer damage tags on lands enrolled in either the Delaware Deer Damage Assistance Program (DDAP) or the Delaware Severe Deer Damage Assistance Program (SDDAP).

Private businesses throughout the state were available to register hunter harvested deer. Deer could also be registered using the phone/internet registration system. This option accounted for 40.6% of all deer checked. Throughout the year, deer killed by motor vehicles were tagged and reported by state or county police and/or Division field personnel. Furthermore, the Delaware Department of Transportation (DelDOT) recorded the number of deer they collected from roadways.

The data provided my hunters when they registered their deer at check stations or via the phone or internet systems provided general harvest information (e.g. harvest location, deer gender, type of tag and weapon used). These systems do not provide the Division with detailed biological information, which is critical when trying to evaluate the health and composition of the herd. Therefore, the Division established biological harvest data collection stations at deer processors across the state. At these stations, staff collected jaw bones from antlered bucks, measured outside antler spread, counted points, and measured main beam length. This information was used to evaluate buck harvest age structure and antler quality and development.

The 2008/09 season marked the first time that a hunter in Delaware harvested a sika deer (*Cervus nippon*). The yearling spike buck was harvested on November 21, 2008 on Mud Mill Rd which is in Deer Management Zone 6. Sika deer were introduced to the eastern shore of Maryland nearly 80 years ago but as their population has grown so too has their range. The Division anticipated that sika deer may migrate into Delaware so in 2007 the Division made a regulation change making it legal for hunters to harvest sika deer during the deer season.

Target Date:

September 30, 2010

Status:

On schedule – per approved extension

Remarks:

The 2008/09 overall deer season resulted in a reported 3rd all-time harvest of 13,926 animals. This was up 1.7% from the 2007/08 season (13,689 deer) which was previously the 3rd all-time harvest and 5.1% below the record reported harvest during the 2004/05 season (14,669 deer). In regards to effort, there were approximately 16,000 hunters that pursued white-tailed deer during the 2008/09 season. The number of hunters in Delaware has remained relatively constant in recent years.

Delaware is divided into 17 deer management zones (DMZ) (Figure 1). The deer harvest is analyzed on a zone basis. Harvest by deer management zone for the 2007/08 and 2008/09 seasons is shown in Table 1. Public lands accounted for 12.0% of the total statewide harvest (Table 2.) An effort was made this year to reduce the number of deer harvested from "unknown" zones by contacting hunters by phone. This reduced the number of unknown zone harvest by 25% (Table 1).

In addition to the standard license tags, Delaware has four special tags which hunters can use to harvest extra deer ($10 antlerless tags, quality buck tags, hunter's choice tags and antlerless deer damage tags). Deer taken on these special tags made up 45.2% of the total harvest during the 2008/09 season (Figure 2).

A key element of successful deer management is the management of the female portion of the population. Careful regulation of the doe harvest can allow herd size to increase, decrease, or remain stable. From 1954 to 1995, Delaware maintained an either sex deer hunting option with no restrictions. During the late 1970's, and throughout the 1980's the percentage does in the harvest fluctuated between 30 – 40%, with a noticeable declining trend between 1983 through 1988. During these years however, the overall deer harvest increased steadily, as did complaints regarding crop damage and destruction of landscaping in suburban areas. In 1990, the Delaware General Assembly passed legislation allowing the Division of Fish and Wildlife to

sell special antlerless deer tags for use in areas where deer damage was occurring. Between 1990 and 1995, significant deer season liberalizations were implemented and the use of antlerless tags was expanded greatly. While the deer harvest continued to increase, the percentage of does in the harvest still did not exceed 40% (Figure 3). By 1995, damage complaints had reached an all time high. In an effort to harvest more female deer, the Division changed the 1996 license deer tag structure from 2 either sex tags to 1 antlerless only tag and 1 hunter's choice tag. In that same year, the December antlerless season was expanded from 2, to 6 days. To further promote the harvest of female deer, free antlerless deer damage tags were made available to farmers having documented deer damage and enrolled in the DDAP. These measures resulted in a statewide harvest consisting of 50% female deer. In 2002, the license deer tags were converted to two antlerless tags. To harvest an antlered buck, hunters had to purchase a hunter's choice tag.

To further promote the harvest of female deer, the Division also altered its deer season structure. In 2004, 8 additional antlerless gun days were added in October and 2 doe tags were added to the hunting license. Due to continuous complaints regarding crop damage from deer, in late August 2006 the Division created the Severe Deer Damage Assistance Program (SDDAP). Those enrolled in this program are allowed to harvest antlerless deer from August 15 through May 15. Past experience has shown that the use of antlerless deer damage tags within the original DDAP, have been effective in increasing the number of does in the total harvests. We believe that this new program will further reduce deer/human conflicts. The percentage of does in the 2008/09 harvest was 55.2% statewide, similar to the 2007/08 harvest (Figure 3). Sex ratio data will continue to be analyzed on a zone basis. Regulations will be reviewed and adjusted as needed in response to management goals.

Along with general harvest data collected when a hunter registers his/her deer, the Division collected biological data on antlered deer/bucks (N = 468). This information included age, outside antler spread, main beam length, and number of points. Currently, Delaware hunters may harvest a maximum of two bucks. However, one must have a minimum outside antler spread of 15 inches. To evaluate the effectiveness of this regulation, the Division examined the average antler spread, number of points, and main beam length within each age class. The rationale behind the 15-inch minimum spread requirement is that it allows hunters to harvest two bucks but protects some of the younger age class deer by one forcing one buck to be at least 2.5 years old or older. Previous data has indicated that very few 1.5 year old bucks have an outside antler spread $\geq$ 15 inches. The Division also wanted to examine if the number of points and/or main beam length was a better separator of yearling and older bucks. As in previous collections, the Division determined that spread is the best separator of yearling bucks from older aged deer. While spread was the better separator between age groups, the Division determined that the 15-inch minimum outside spread requirement protected a large number bucks 2.5 or older (42%). It appears that a better minimum spread requirement would be 14 inches instead of 15 inches. Under this requirement, only 27.2% of the bucks that are 2.5 would be protected, while > 95% of the yearling bucks would still be protected.

Recommendations:

This job should be continued as part of the Division's 5-year plan. The annual deer harvest continues to remain high, as have deer damage complaints, although their numbers seem to have begun to decline. Continuous monitoring is essential for sound management of the herd.

Prepared by:

Joe Rogerson
Game Mammal Biologist
Delaware Division of Fish & Wildlife

Reviewed by:

Rob Hossler
Program Manager – Game Species
Delaware Division of Fish & Wildlife

Table 1. The total number of white-tailed deer harvested within each of the 17 Delaware Deer Management Zones during the 2007/08 and 2008/09 seasons and the difference between seasons.

Deer Management Zone	2007/08 Season	2008/09 Season	Difference	Percent Change
1	1,293	1,231	- 62	- 4.7%
2	506	597	91	18.0%
3	476	599	123	25.8%
4	411	457	46	11.2%
5	451	558	107	23.7%
6	737	826	89	12.1%
7	1,026	1,146	120	11.7%
8	716	620	- 96	- 13.4%
9	791	831	40	5.1%
10	457	486	29	6.3%
11	1,277	1,356	79	6.2%
12	736	793	57	7.7%
13	647	550	- 97	- 15.0%
14	728	724	- 4	- 0.1%
15	707	766	59	8.3%
16	1,188	1,120	- 68	- 5.7 %
17	435	412	- 23	- 5.3%
Unknown[1]	1,107	854	- 253	- 22.9%
Total	13,689	13,926	237	1.7%

[1]Consists of deer that were harvested and the deer management zone was not indicated. An effort was made this year to reduce this number by contacting hunters by phone to help determine the correct zone of harvest.

Table 2. The total number of white-tailed deer harvested on each of the areas open to public hunting during the 2008/09 season.

Public Area	Total Harvest
National Wildlife Refuges	
Bombay Hook NWR	57
Prime Hook NWR	38
State Forests	
Blackbird SF	96
Redden SF	147
Taber SF	14
County & State Parks	
Middle Run CP	62
Brandywine Creek SP	27
Cape Henlopen SP	62
Delaware Seashore SP	11
Fort Delaware SP	0
Fort DuPont SP	3
Holts Landing SP	3
Killen Pond SP	1
Lums Pond SP	33
Trap Pond SP	38
White Clay Creek SP	121
Industrial Forest Lands	
Industrial Forest Lands	21
Wildlife Areas	
Assawoman WA	49
Augustine WA	36
Blackbird Reserve WA	4
Blackiston WA	37
C&D Canal WA	131
Cedar Swamp WA	49
Little Creek WA	17
Marshy Hope WA	3
McGinnis Pond WA	0
Midlands WA	37
Milford Neck WA	38
Nanticoke WA	32
Norman G. Wilder WA	68
Old Furnace WA	36
Prime Hook WA	48
Ted Harvey WA	16
Woodland Beach WA	22
Unknown	**309**
Total	**1,666**

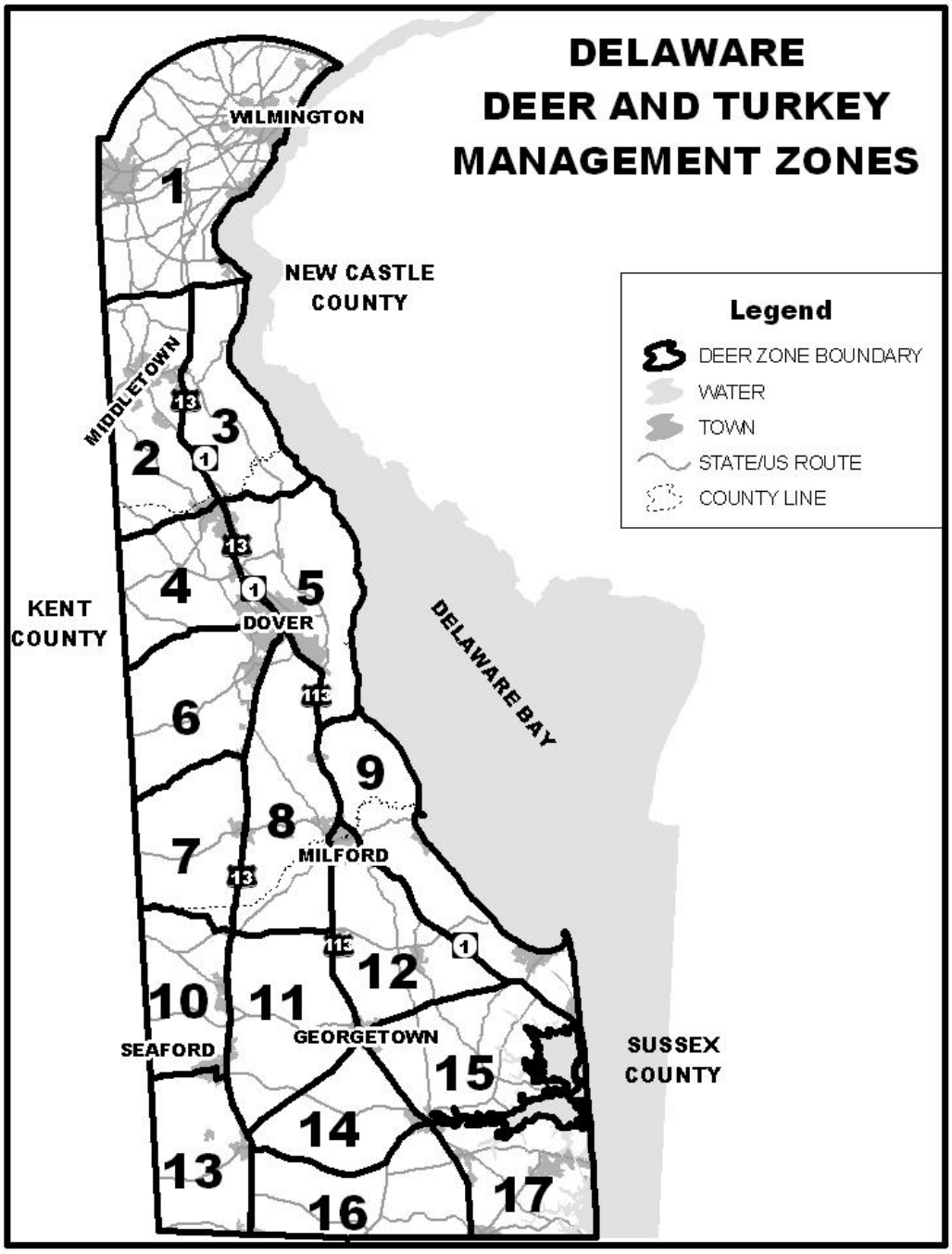

Figure 1. Map outlining the boundaries of the 17 White-tailed Deer Management Zones within Delaware.

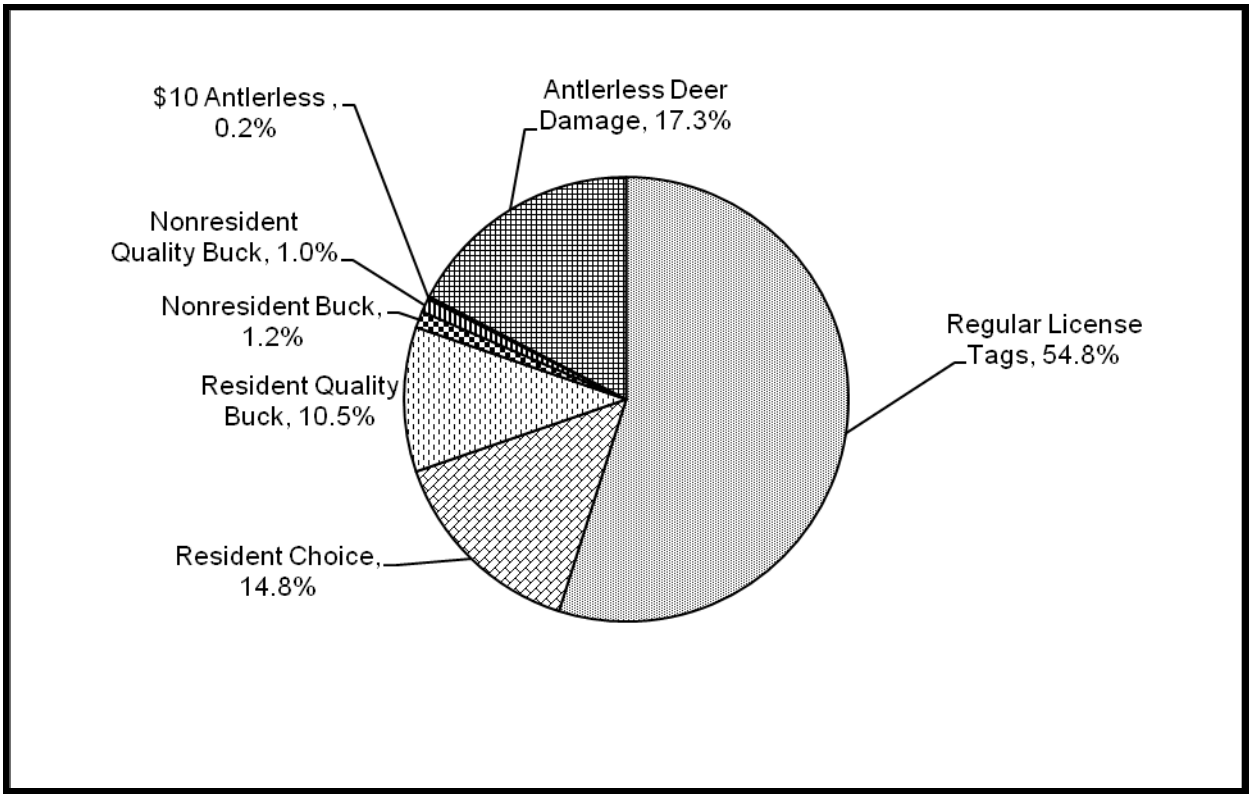

Figure 2. The percentage of special deer tags compared to regular license tags used by Delaware hunters during the 2008/09 deer hunting season. Special tags are comprised of hunter's choice tags, quality buck tags, $10 additional antlerless deer tags, and antlerless deer damage tags.

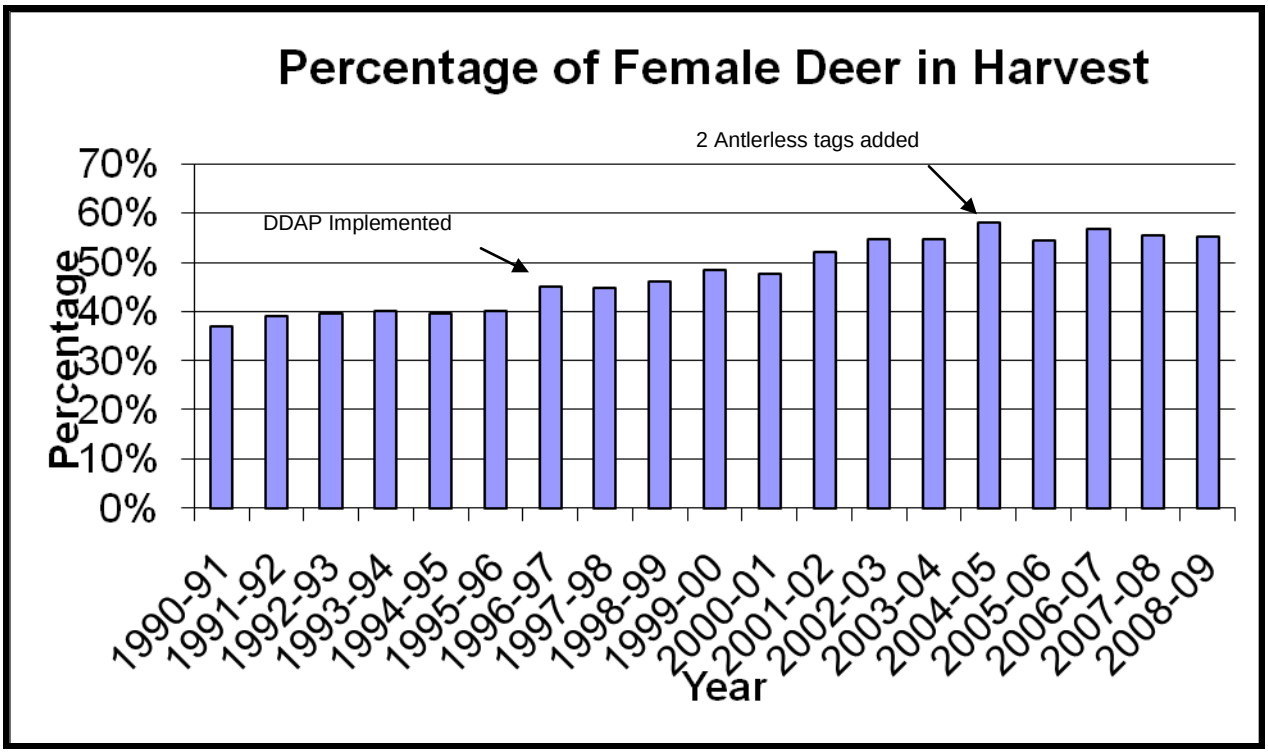

Figure 3. The percentage of female white-tailed deer in Delaware's total harvest from 1990 through 2008.

STATE: Delaware

GRANT NUMBER AND TITLE:

W 35R – Wildlife Investigations: White-tailed Deer

OBJECTIVE:

To maintain a healthy and viable deer herd and minimize human/deer conflicts

JOB NUMBER AND TITLE:

Job 2 – White-Tailed Deer Population Ecology Monitoring and Evaluation.

JOB OBJECTIVE:

To determine white-tailed deer population size, demographics (i.e. bucks/doe, fawns/doe), antler cycles, survival, movement rates, and environmental impacts.

ACTIVITY:

Between 22 February and 11 March 2009, Vision Air Research Inc. out of Boise, ID completed an aerial infrared deer population survey across the state. This statewide survey was conducted by flying an 8x2-mile transect block within each of the 17 deer management zones. Survey blocks were located within each zone based in proportion to available deer habitat (forests, wetlands, and rangelands) within each zone. Agricultural lands were not included as deer habitat. This design allowed for comparisons of deer density between zones. To determine suitable locations for survey blocks, the Division contracted with GeoDecisions to develop a computer program that would select survey blocks that most accurately represent habitats within the management zones. Along with the aerial survey, the Division contracted with the University of Delaware to conduct a deer survival and movement study in Sussex County, DE (Attachment 1).

TARGET DATE:

September 30, 2010

STATUS:

On schedule- per approved extension

REMARKS:

Deer Population Estimation:

Survey Background

The Division completed its first aerial infrared deer population survey in December 2005. This gave the Division its first comprehensive deer population estimate for the state. Since the 2005 season, various programs have been put into place to help increase the deer harvest, specifically

the harvest of female deer. In 2009, a second survey was completed to determine how the deer population has responded to these changes. Comparing the survey techniques between the 2005 and 2009 surveys, the Division made some improvements. Some of those changes were:

1) New survey blocks were selected within each management zone based on the new 2007 aerial habitat photos
2) Location of blocks were randomly selected by a computer program to eliminate survey bias and to more accurately represents habitats within the management zone
3) The survey was conducted in March rather than December to provide a more accurate measure of the post-hunting deer population.

What We Learned

The completion of this second statewide aerial deer survey provided a much needed comparison with the 2005 aerial survey to verify results and determine measures of variability. This comparison confirmed that:

1) This technique only estimates the deer population and should not be considered anything more (not a census).
2) There are temporal differences (between survey nights based on weather or moon phase) and detection differences (among habitats) that create a degree of variability of approximately 21%.
3) Spatial variability by moving blocks within zones was not an issue except in Deer Management Zone 1.
4) This comparison confirmed the need to develop additional indices of population abundance to continue to verify and refine the aerial survey estimates because due to its expense, the aerial survey probably can only be funded every 5 years.

Results

Results of the aerial survey showed wide differences in some of the 17 individual management zones, suggesting future management efforts might need to be based on a larger scale, i.e., combining zones or on a county level. The statewide deer population estimate (post-hunting season) was 31, 071 deer which was a 17.3% reduction from the 2005 estimate (37,563 deer). This population estimate is still 10.7% above the target goal of 40 deer/square mile of deer habitat with an estimates statewide density of 44.3 deer/square mile. Achieving this target density has been complicated by the fact that deer habitat has been reduced by 18.4 square miles (2.6%) since 2005 by conversion to non-deer habitat. County population estimates show that the deer population in Sussex County has been reduced 5.8% (50.3 deer/square mile) since 2005, while the Kent County population has been reduced by 11.4 % (30.8 deer/square mile). The density estimates for New Castle County are 47.9 deer/square mile; however a comparable reduction percentage was not available due to significant differences in population estimates cause by relocating the survey block. This difference between survey blocks suggests splitting Zone 1 into two deer management zones, one above and one below Interstate 95. Deer management zone data indicated that the deer population was still significantly above target levels in, Zones 2, 7, 10, 14 and the north portion of Zone 1. Zones with populations below target levels were Zones 5 and 12. The other 11 zones were close to target levels when considering survey variability.

Summary

The Delaware statewide deer population has stabilized and started to decrease since 2005, but the population level is still above the statewide goal. Several management zones have excessive deer while a few might be below target levels. The second aerial survey allowed for a comparison and a measure of detection variability but appears to be correlated with other population indices. Variability measurements will be incorporated into management population goals and additional indices will be developed and used to verify and refine the population estimates and target levels. Finally large differences between zones might suggest management at a larger scale, e.g. county-wide or combining management zones.

Deer Movement and Survival Research:

Under the proposed schedule of activities, deer live capture activities were slated to commence in January 2009. However due to contract issues related to field housing, no fieldwork was conducted during Winter 2009. A revised contract between the University of Delaware and the Division was finalized in Summer 2009 with an anticipated revised project start date of December 2009. Project completion is now scheduled for July 2012.

In preparation, radio transmitters and associated trapping supplies for the first year of the study have been purchased and field housing in close proximity to the study area has been secured. A technician was hired by the University of Delaware to inventory and refurbish existing equipment, as necessary. In addition, two months were spent investigating the study area for potential trapping locations and making contacts with local landowners for possible trapping access.

RECOMMENDATIONS:

This job should be continued as part of the Division's 5-year plan.

PREPARED BY:

Joe Rogerson
Game Mammal Biologist

REVIEWED BY:

Rob Hossler
Program Manager – Game Species

Table 1. Estimated Deer Density in 2005 and 2009 within each of Delaware's 17 Deer Management Zones.

Deer Management Zone	**2005 Deer Density[1]**	**2009 Deer Density[1]**
1	134.8	46.7**
2	59.7	85.4
3	33.2	22.0
4	42.1	34.8
5	42.1	14.5
6	15.2	37.6
7	72.4	65.4
8	57.9	59.4
9	39.2	22.5
10	37.7	108.7
11	43.5	21.1
12	36.0	16.8
13	16.3	53.6
14	73.2	114.4
15	70.8	29.8
16	74.6	51.8
17	11.3	53.8
Statewide Average	**52.2**	**44.3 (-15.1%)**

[1] Deer Density is calculated as the number of deer per square mile of deer habitat. Due to detection variability with this survey technique, estimates have a variability of +/- 20.75%.

**Survey block location was changed significantly from the north portion of the zone (2005) to the south portion (2009). This might justify splitting the zone into two zones.

ATTACHMENT 1

SPATIAL ECOLOGY OF WHITE-TAILED DEER IN SUSSEX COUNTY, DELAWARE

Principal Investigator: Dr. Jacob L. Bowman

Problem Statement

Deer management in Delaware is an example of the complex situation facing wildlife managers. By the 1990s, the deer population had expanded from near extinction in the early 1900s to extremely high population densities in many areas. As deer populations increased, managers began to struggle with how to effectively manage deer. Generally, deer abundance in rural areas is managed through the use of a general hunting season, but landownership can affect the efficacy of harvest for controlling deer numbers. The landscape is a mosaic of ownership that has differing views on how deer should be managed. One concern is that public land provides a refuge from harvest on adjacent agricultural lands where these deer may be causing damage to crops. To better understand the capacity of public lands to provide a refuge for deer harvest, estimates of survival, spatial use, home range, and movements are necessary. Therefore, we will investigate the spatial and temporal dynamics of spatial use, home range, and movements; document mortality causes; and estimate survival rates of deer on the public land / private land interface.

Objectives

Female white-tailed deer will be monitored via radio telemetry to investigate survival and spatial and temporal use of the landscape in the Delaware, specifically Sussex County, Delaware. This research will elucidate the impact of public lands for providing refuges to deer for protection from harvest on adjacent private lands.

Specific objectives will be:

1. Estimate survival and cause-specific mortality rates

2. Estimate spatial use of private versus public lands

3. Estimate home range size

4. Estimate movement rates

Methods

We will capture 30 adult female deer using clover traps, dropnets and dartguns. Each captured adult deer will receive a VHF radio-collar. We will eartag each deer with metal tags and plastic cattle tags for visual identification. Standard body measurements and age will be recorded. Monitoring of each deer will begin 1 week after capture and continue until December 2010. Because of the size of the area, we will monitor deer using ground telemetry with handheld receivers and antennas. Deer locations will be collected every 3-5 days. We will also use focal observations to collect movement rate data. During each focal observation, deer will be located each hour for 6 hours in 4 periods (0300-0859, 0900-1459, 1500-2059, 2100-0259 hrs). We will

collect one focal observation during each of these periods every 1-3 months. This sampling intensity will provide the sample size necessary to make comparisons among seasons. Seasons will be designated as winter/post-breeding (December – February), spring/fawning (March – May), summer/fawn-rearing (June – August), and fall/breeding (September – November).
We will use the telemetry data to estimate fixed kernel home ranges. An ANOVA will be used to determine if home range estimates differ annually or seasonally. We will use focal observation data to calculate hourly movement rates. We will conduct ANOVAs blocking on individual to determine if movement rates differ by period of the day, year, or season. We will combine hourly movement rate data with how the deer are using the various habitat types to determine vulnerability to harvest. Understanding how deer use the landscape is paramount to fully understanding the spatial dynamics of deer ecology. We will use compositional analysis to determine if spatial use differs annually or seasonally for third order selection.
Radio-telemetry will allow us to document the causes and timing of mortality events. We will estimate survival rates using a staggered entry modification of the Kaplan-Meier procedure and compare survival rates among seasons and years using contrasts. Cause-specific mortality rates will be estimated and compared among seasons and years.

Outcomes/Deliverables

This research will provide baseline information about the spatial ecology of white-tailed deer on the Delmarva Peninsula. This information can be used to design more effective harvest regimes on public lands to prevent them from becoming refuges and hindering deer management.

Justification

Management decisions should always be based on the best available scientific data. Currently, spatial ecology data for white-tailed deer on the Delmarva Peninsula are lacking. Additionally, interest for decreasing the white-tailed deer population is high, but management may be inhibited by landuse patterns. In order to effectively manage white-tailed deer in this landscape, research elucidating their spatial ecology is necessary.

Benefits

The Delaware Division of Wildlife lacks data to determine if landuse patterns are affecting deer management. This research will elucidate the impact of spatial ecology on deer management on the public land / private land interface and recommend management strategies that will be most effective for decreasing deer abundance on the Delmarva Peninsula.

Time Frame – (Revised)

Year 1 (2010)
Capture activities (December 2009 – March)
Radio telemetry monitoring of deer (January – December)
Year 2 (2011)
Capture activities (December 2010 – March)
Radio telemetry monitoring of deer (January – December)
Year 3 (2012)
Data analysis and reporting (January – July)

State: Delaware

Grant Number and Title:

W 35 R – Wildlife Investigations: White-tailed Deer

Objective:

To maintain a healthy and viable deer herd and minimize human/deer conflicts.

Job Number and Title:

Job 3. White-tailed Deer Management Plan

Job Objectives:

Create a formal plan related to deer management in Delaware. This plan will serve as the guiding document into "how" and "why" deer are managed in Delaware. We will utilize harvest data, population data, and feedback from various stakeholder groups to formulate objectives and goals that will direct the Division's efforts related to deer management.

Activity:

To help solicit feedback from the general public, a 20-member advisory committee representing numerous deer stakeholders groups was formed. This group met on three occasions (June, July and August 2008) to discuss current deer management issues and goals. In an effort to eliminate Division bias, these meetings were facilitated by outside representation, Douglas Hotton, retired Maryland Deer Project Leader. The information gathered at these meetings was incorporated in the development of Delaware's formal Deer Management Plan. Much of this grant period was spent developing and writing this document. Once completed, the stakeholder group will reconvene to discuss its content.

Target Date:

September 30, 2010

Status:

On schedule- per approved extension.

Remarks:

Previously, a formal deer management plan did not exist for Delaware. That's not to say the Division didn't have a "plan" concerning deer management but the goals and objectives were never clearly defined in a written context. As a result, many of the Delawareans didn't know why the Division was making certain decisions pertaining to deer management. Therefore, the Division decided to create a formal Deer Management Plan so that its goals and objectives were clearly defined. Data used to support management decisions as wells as the views and opinions

of Delawareans will be included in the plan. Once completed, the document should create a stronger relationship between the Division, deer hunters, agricultural users, and non-consumptive outdoor recreationalists, as all of these groups were involved with the creation of this document. Furthermore, having clearly defined goals and objectives will help the Division's management efforts and improve monitoring efforts.

Recommendations:

This job should be continued as part of the Division's 5-year plan. The Deer Management Plan will guide the Division's efforts concerning deer management over the next ten years.

Prepared by:

Joe Rogerson
Game Mammal Biologist

Reviewed by:

Rob Hossler
Program Manager – Game Species

State: Delaware

Grant Number and Title:

W 35 R – Wildlife Investigations: White-tailed Deer

Objective:

To maintain a healthy and viable deer herd and minimize human/deer conflicts.

Job Number and Title:

Job 4. White-tailed Deer Density Impacts

Job Objectives:

To determine the ecological carrying capacity and impacts associated with different deer densities within varying habitats in Delaware and to determine the deer densities needed to maintain forest regeneration and plant species diversity.

Activity:

During this grant period, the vegetation sampling design and exclosure size (0.015) was finalized and some of the fencing material purchased; however because of the delay in obtaining the aerial deer density survey results, no exclosures were constructed. It is anticipated that several exclosures will be constructed in the spring of 2010.

Target Date:

September 30, 2010

Status:

On schedule- per approved extension.

Remarks:

The second aerial deer survey revealed that this technique for estimating deer density has sufficient variability to exclude its use for smaller more defined areas in which exclosures will be constructed and habitat impacts evaluated. Therefore exclosures will be constructed in deer management zones with the least amount of annual variability (coefficient of variation) associated with hunter harvest, the largest source of population change. Once areas for exclosure construction are finalized (currently Taber and Redden State Forests and Prime Hook Wildlife Area), several spotlight surveys of a defined area surrounding each exclosure will be conducted during the late-winter to determine the minimum deer density.

Recommendations:

This job should be continued as part of the Division's 5-year plan. This job should be continued as a cornerstone of the Division's deer management efforts consists of developing ecological carrying capacity estimates.

Prepared by:

Rob Hossler
Program Manager – Game Species